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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,945

02/10/2006

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HAM 830015

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08/02/2010

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EXAMINER

MCCULLEY, MEGAN CASSANDRA

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

08/02/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,945	<b>Applicant(s)</b> DIAKOUMAKOS ET AL.	
	<b>Examiner</b> Megan McCulley	<b>Art Unit</b> 1796	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 30 and 45-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30 and 45-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: The specification as filed does not have support for claim 47 wherein the nano-clay is a natural or modified bentonite, saponite, hectorite, montmorillonite or synthetic mica fluoride. Support for this limitation is found in PCT/EP04/51796 claim 7, of which this application is the national stage entry. However, this disclosure should be added to the specification of the national stage entry.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 30 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marten et al. (U.S. Pat. 5,847,027) in view of Eichorst et al. (US 2001/0019813).

Regarding claims 30, 47: Marten et al. teaches a method of mixing (col. 3 lines 60-65) a cyclocarbonate resin (col. 5 lines 45-50), a natural or synthetic, modified or unmodified nano-clay/bentonite (col. 15 lines 45-53) and a hardener/polyamine (col. 5 lines 60-61). Curing is disclosed (col. 16 lines 15-20) to form a urethane based polymer (col. 5 lines 60-65). There is no isocyanate used.

Marten et al. does not teach the clay having a thickness of less than 25 angstroms or an aspect ratio of higher than 10. However, Eichorst et al. teaches a

Art Unit: 1796

polyurethane composition (abstract) comprising clay platelets of montmorillonite (para. 43) with a thickness of about 0.001 micron and a diameter of 0.050 microns (para. 43). This is calculated to 10 angstroms thick and an aspect ratio of 50. Marten et al. and Eichorst et al. are analogous art because they are both concerned with the same field of endeavor, namely urethane based compositions filled with clay particles. At the time of the invention a person having ordinary skill in the art would have found it obvious to combine the specific clay particles of Eichorst et al. with the composition of Marten et al. and would have been motivated to do so for such desirable properties as increased electrical conductivity and optical transparency as stated by Eichorst et al. (para. 25).

Regarding claim 45: Marten et al. teaches the cyclocarbonate resin is made from amine modified epoxy resin and carbon dioxide (example 2), which would produce the claimed structure where  $R_1$  and  $R_2$  are linear or branched or cyclic saturated or unsaturated nitrogen containing groups.

Regarding claim 46: Marten et al. teaches further mixing an epoxy (col. 5 lines 55-60).

Regarding claim 48: Marten et al. teaches the composition is cured at room temperature (col. 16 lines 15-20).

### ***Response to Arguments***

Applicant's argument regarding the support for claim 47 is persuasive. However, the present specification should also contain disclosure of this feature. See objection to the specification above.

Applicant's arguments filed June 17, 2010 have been fully considered but they are not persuasive.

A) Applicant's argument that Marten et al. discloses curing before adding the additive (F), while the instant claims require the clay to be mixed in the composition before curing is not persuasive. Marten et al. discloses that a functional equivalent of the claimed clay is added so that it is present as the polyurethane is forming (col. 13 line-col. 14 line 2). Therefore it is obvious to add the clay, as a functional equivalent of the solvent, to the pre-reacted components. This is further supported by the statement that "These additives [(F)] can, if desired, be added to the curable mixtures just before processing" (col. 14 lines 50-55).

B) Applicant's argument that figure 3 and example 36 shows unexpected results is not persuasive. Comparison must be made with the closest prior art, and must be commensurate in scope with the claimed invention (MPEP 716.02(d) and 716.02 (e)). The comparison reference RPU is not the composition disclosed in Marten et al. Also, the inventive composition NPU is not commensurate in scope since only one type of cyclocarbonate resins, one type of clay and one type of hardener is used while the claims cover many types of these compounds.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megan McCulley whose telephone number is (571)270-3292. The examiner can normally be reached on Monday - Thursday 7:30-6:00 EST.

Art Unit: 1796

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571) 272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harold Y Pyon/  
Supervisory Patent Examiner, Art Unit 1796

/M. M./  
Examiner, Art Unit 1796